PES, markets and property rights: a comment on Wunder's revisited concept of PES and a proposal of conceptual framework

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Abstract

Payments for Environmental Services (PES) are often described as market-based instruments as they are used to change relative prices, and therefore to provide incentives. Following the line of thought of institutional economists, we argue that a market is a place for the transfer of property rights (the right to perform certain actions), beyond the goods and services which are exchanged. We underline the need for aclear distinction between "ecosystem services" (services obtained by peoplefromnature) and "environmental services" (services rendered by people to other people). Against Wunder's (2015) interpretation, we explain why ecosystem services are, by nature, collective or public goods, and as such do not lend themselves to appropriation.We argue also that appropriation is a precondition of exchanges, even in a service economy, unless admitting that there are markets without exchange. In PES there is no transfer of property rights: the holders simply freeze or use their ownland development rights. PES embedded into REDD+ projects, which are "backedagainst the carbon market", and PES in which service's providres are selected through auctions: these PES can be analysed as "hybrids" combining a market-based procedure and bilateral agreements about setting environmental easements.

Keywords: payment for environmental services, market-based instruments, markets, commodification, utilitarianism, incentives.

Highlights:

- PES are often described as market-based instruments
- Distinguishing between ecosysteme service and environmental services clarifies the débate
- Appropriation is a precondition of exchanges and ecosystem services are not suitable for approriation
- There is no market without exchange, even for markets of services, and what is echanged are property rights
- In PES there is no transfer of property rights, but some PES can be backed against carbon markets

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> *"Market-based instruments (…) include payments for ecosystem service provision (PES), pollution taxes, cap-and-trade schemes, ecocertification and labelling, and certain capacity building measures" (Lockie, 2013).*
>
> *"…conservation has adopted a number of market-based instruments (MBI), notably payments for ecosystem services (PES)" (Carrière et al., 2012)*
>
> *"Although not necessarily inherent to the ecosystem services framework, this governance agenda has come along with two associated measures, (1) the economic valuation of these services, and (2) the promotion —and increasing use— of market-based policy tools, especially the so-called ''payments for ecosystem services'' (Muradian and Rival, 2012)".*

These three excerpts reflect the frequentconfusion in the recent literature between "payment for ecosystem services" (PES) and market-based instruments (MBIs). Tradable permits, auctions, environmental taxes, "green" labels and PES are regularly classified asbelonging to the category of "market-based instruments" (MBIs) (Pirard, 2011, Commission of the European Communities, 2007). In particular,the widely citedTEEB (*The Economics of Ecosystems and Biodiversity*) report (TEEB, 2009), states:"*Experienceshowsthatenvironmentalgoalsmaybereached moreefficiently bymarket-basedinstrumentsthan by regulationalone*". The report also specifies: *"Market-based instruments, such as taxes, charges or tradable permits can, if carefully designed and implemented, complement regulations by changing economic incentives, and therefore the behaviour of private actors, when deciding upon resource use" (p. 31).*The rationale behind calling such tools "market-based instruments" (MBIs) is that they all are used to change relative prices, and therefore encourage reliance on the "self-interest" of economic agents who take the decisions. ForStavins (2005), "*market-based instruments are regulations that encourage behaviour through market signals rather than through explicit directives*". This analytical entry point explains why environmental taxes are classified as MBIs, although it is hard to see how they rely on a market.

Pirard (2011) argues that the reference to *pricing* is the common denominator among MBIs, thus clearly differentiatingthem from regulatory instruments which rely on prescription. He points out that this classification obscures the very different principles underlying the range of instruments categorized as MBIs, especially PES. Nevertheless he still uses *pricing* as the main variable to differentiate MBI instruments. This choice explains why PES schemes are classified in different categories, with different degrees of closeness to markets: while trading of forest carbon and Coasian type agreements both embed PES schemes in their implementation, forest carbon exchange schemes are closer to a classical market configuration than agreements between upland and lowland farmers to improve the quality and quantity of water. Nevertheless, the creation of carbon credits and of an international platform on which to trade them is not a precondition for the agreement to be negotiated, and responds more to a conjunctural choice in a policy context dominated by the belief that markets are more efficient than other types of more regulated schemes, e.g. a fund to fight deforestation in the case of forests. Corbera et al. (2007) also point to the difference between different schemes involving a PES design and conclude that "*PES are not actual markets where ecosystem services are sold to service buyers*" and therefore distinguish between amarket for

ecosystems services (MES)[2] and PES. Other scholars have highlighted the fact that PES do not function as a market *per se*, but have introduced a market-oriented vocabulary and way of thinking in the social and policy spheres (Milne and Adams, 2012). To equate incentive instruments (i.e. taxes and PES) with MBIs reinforces their separation from prescriptive regulations. Such a contrastsuggests a desirable switch from a bureaucratic and rigid administrative universe to a *modern* one where the free will of individuals, capable of weighing their options and deciding accordingly, is emphasized. In a nutshell, it's bureaucracy versus markets. Calling such a wide range of different instruments *market-based* amounts to promoting an "organizing fiction" of the world – sometimes unnoticed by those who relay this language – in which the market is identified as the only intelligent alternative to administrative directives for the management of the environment.

In the present paper we explain why pricing is not the right analytical entry point to understand the structural difference between PES and markets, this being one of the main sources of confusion in the literature when PES are associated with MBIs and commodification. First, the services to be regulated (the type of services involved in PES) are properties, like the quality of water or the composition of the atmosphere, which cannot be exchanged, only altered or enhanced. Second, markets are defined by the transfer of property rights in a competitive setting between suppliers and aquirers.We argue that most PES are based on a contractual relationship between actors to compensate for avoided land use change, and that this relationship is decoupled from the creation of a market, whose aim is to exchange and transfer property rights. The recent tendency to equatemarket metaphors (pricing mechanisms and contractual relationships) with genuine markets responds to a policy context and a desire to create a tradable commodity and to rank instruments in a heirarchyin which MBIs are considered to be*smarter* than instruments that are prescriptive*,* i.e., based on constraint.

1. Incentives, relative prices and markets

According toE.F. Rosenbaum (2000): "*Many economists tend to find markets almost everywhere on Earth and in history* (…). *But* (…) *the market concept is hardly analyzed in depth. Nor are there serious attempts to examine empirically where markets exist*". Many different definitions of markets have been provided by different economic schools[3]. Rosenbaum (2000) distinguishes between three sets of definitions: (i) *observational* definitions, "*which refer to some empirical phenomenon, often together with one or several stylized facts about prices and/or commodities*"; (ii) functional definitions which "*focus on what the market* does *rather on what, from an empirical point of view, the market* is". According tothe functional definition, "*the concept of a market is equated with the* determination of relative prices *by demand and supply*", which correspond to the MBIrhetoric presented above.

[2]For Corbera et al. (2007), "MES must have a well-*defined ecosystem service and a well-defined trading commodity, and active supply and demand sides must coexist*" (p. 366).

[3]Hodgson (1988) comments that only a few economists have attempted to define a market while, for most, "*the market has been taken for granted*". Among these economists, he mentions Cournot, Jevons and Alfred Marshall, who provided rather vague definitions (such as the one of Jevons, 1871: "*to mean any body of persons who are in intimate business relations and carry on extensive transactions in any commodity*" – quoted by Hodgson, 1988, p.173.

The third definition Rosenbaum mentions is (iii) a*structural definition*which draws attention to "*the underlying and hence not immediately observable structure of a market, emphasising the alleged mechanisms and structures that give rise to market phenomena*". Such definitions have been favoured by institutional economists who pay attention to history and to the issue of what drives institutional change. G.M. Hodgson, a prominent figure in institutional economics, defined the market as "*a set of social institutions in which a large number of commodity exchanges of a specific type regularly take place, and to some extent are facilitated and structured by those institutions. Exchange (…) involves contractual agreements and the exchange of property rights, and the market consists in part of mechanisms to structure, organize, and legitimate these activities*" (Hodgson, 1988, p. 174). For institutional economists, whether they are considered to be "old" or "new" institutionalists, markets are, above all, a place where legal property rights are exchanged. John Commons, who symbolizes "old" institutionalism, states: "*Transactions are the means, under operation of law and custom, of acquiring and alienating legal control of commodities, or legal control of the labor and management that will produce and deliver or exchange the commodities and services, forward to the ultimate consumers*" (Commons, 1931). As Coase (1992), who features himself as new institutionalist, put it: "… *what is traded on the market are not, as often supposed by economists, physical entities, but the right to perform certain actions*" (p. 717). Admittedly, the market for services is not exactly to the same as the market for commodities: the transfer of property rights does not entail a change in the ownership of physical assets, but the transfer by the seller of a service of an agreed fraction of the working time to the client. The seller transfers the (future) product of his/her labour to the buyer, and exclusively to the buyer (property right). The labour market works in the same way, but so does consulting, cutting hair, transporting goods, etc.

According tothis definition, we can agree that emission rights (or catching rights in fisheries) can be considered as transferable property rights, in the sense that they allow their holder to undertake certain actions and those rights can be exchanged on markets[4]. Environmental taxes, like any other tax, change the relative prices of certain actions and, in this respect, can be compared with emission rights. Besides, paying such taxes is the counterpart for performing certain actions, and can therefore be considered as property rights. But the main difference concerns the degree of transferability: there are no markets for *exchanging* taxes whereas there are markets for emission permits, tradable development rights and "individual transferable quotas" in fisheries[5]. If pricing were the cornerstone of markets (rather than the exchange of rights), it would be difficult to see why penalties entailed by prescriptive regulations (for instance, on the payment on the damage caused by pollution) could not be classified asMBIs: Even if there are several motivations for compliance with the law, it was argued by Gary Becker (1976) and many other scientists of utilitarian thinking, that compliance with the law by individuals could be interpreted as deriving from a cost-benefit analysis: agents weigh the

[4]Vatn (2010) coined "*an ideal type of the market*" as "*a system of voluntary exchange*" (p.1246). Unfortunately, he focuses on the voluntary dimension of the exchange and does not say exactly what has to be exchanged on markets to distinguish between mere "exchanges" and a market.

[5]Some authors including Corbera et al. (2007) and Vatn (2010) emphasize the public character of the financing of many PES to distinguish them from "standard markets" (Vatn, 2010: 1246). But the involvement of public authorities is not sufficient to clearly distinguish between what MBIs are and what they are not. Even the fact that the money collected by payments is not "voluntary" (but is collected through a tax on water, for instance) does not seem to be a strong enough law to portray PES as non-market instruments. On the other hand, the reference to the voluntary dimension would be useful to question equating environmental taxes (which are compulsory) and MBIs.

probability of being caught and punished, and the benefits to be had from breaking the law. "*A Fine is a Price*", to cite the title of a famous article by Gneezy and Rustichini (2000).

Grouping the above mentioned economic instruments as MBIs on the sole grounds they have an impact on *pricing*thus seems to be a weak argument. Classifying them between *incentives*and prescriptive seems to be more justifiable, but could also be questioned by the above mentioned utilitarian cost-benefit interpretation of "why do people follow a rule?". In practice, the wide use of such a categorization can be explained by the belief that markets are more efficient than administrative regulationsin managing environmental services (Gómez-Baggethun et al., 2010).

Markets of services and property rights

Characterizing markets essentially as transfers of property rights, i.e. social authorization to perform certain actions to adopt Coase's terms, is challenged by analysts arguing that in the markets of services there is no transfer of property rights. Yet, Wunder (2015) criticising Karsenty's 2011 tentative definition of PES (see infra), argues that the implicit idea that *"one can only sell what one possesses"* is "*a generalized misconception*" of the economy of services:

> *"exchange of property rights is usually not required in service trade: a teacher does not own the provision of knowledge, a house cleaner has no patented right to cleanliness, and a dentist does not own his clients' teeth. Following Shelley (2011), ES instead imply the provision of stewardship in ways where humans and nature interact".*

But this argument ignores the exchange itself. Services (environmental or not) are reduced to "stewardship" which can be provided without any exchange.Going a step farther and suggesting that the services economy is unrelated to markets[6], leads to something quite odd:*a market without exchange*. Wunder's argument suggests that institutional and neo-institutional economists just overlooked the economy of services and implicitly referred to the exchange of goods when theorizing about markets. Is this right? Another well-known representative of neo-institutionalism, D. North (1977:711) put forward the following: "*An essential pre-condition for price-making markets is the existence of well-defined and enforced property rights over the good or the service*[7] *to be exchanged".* Clearly, North considered markets of services, with respect to property rights over the good or the service.

Obviously, the (private) teacher does not own the knowledge he/she delivers, but Wunder simply disregards the fact that what is transferred *exclusively* to the payer is the "skilled labour-time" of the service's provider, not the knowledge which is public good, and the provider only "owns" the time he/she can decide to allocate to a client. The exchange is "skilled labour time against money", as already analysed by K. Marx who referred to "labour power" as "*the aggregate of those mental and physical capacities existing in a human being, which he exercises whenever he produces a use-value of any description*" (Marx, 1867). In general, the qualification is more important than the time allocated: the more skilled the labour time dedicated to the service contracted, the higher its value (as anyone can verify with top lawyers, famous singers or consultants). Yet, there are other services where it is not the skilled labour time that matters but the transfer of a financial guarantee over

[6]An arguments, however, not advanced by Wunder
[7]Our emphasis

time, e.g. the insurance market. The contract anticipates the possibility of damage occurring which will be covered by the insurance scheme, hence a portion of the money owned by the insurance company will be transferred to the victim of the damage. The only market situation in which one can sell something she/he does not possess (yet) is through "short selling" on financial markets. Short selling means selling an asset that is not currently owned by the seller who will manage to own it at the agreed date of the transfer for delivering the asset to the buyer. But even there, ownership of the asset must be effective the day the transaction occurs.

Remember that the starting point of our analysis is that PES schemes cannot be analysed as markets, since they lack several conditions included in the definition of markets such as competition, substitutability of the good or service and, more basically,there is a contractual agreement to suspend – but not to transfer – property rights. This is for "land-use restricted" PES. In "assets-building PES", there is an exchange of "labour time against reward" for enhancing ecosystem services, which could suggest that such peculiar PES would qualify as "markets". But this would be misguiding. A market entails "alienation" of the fruit of the (skilled) labour, i.e. its transfer to the payer. Yet, the environmental service rendered through assets building (such as planting trees) is performed on the land owned or controlled by the labourer, and the trees planted belong to him/her, not to the payer. This characteristic distinguishes PES from "out-growing" schemes implemented by companies who sometimes claim they run PES schemes since they pay the farmer to plant trees (e.g. shea butter trees), on his own land – but with a contractual agreement for the company to pay an initial subsidy and the farmer to give the company exclusive purchasing rights to the fruits or the wood produced by these trees. The assets-building PES does not involve alienation of the physical assets created, which remain the property of the labourer. Furthermore, since ecosystem services are, by nature, collective or public goods, they are not "transferred" and should be considered as positive externalities someone has paid for.

2. What are PES about?

We agree with Wunder (2015) about the usefulness of proposing ideal-types for clarifying and understanding conceptual constructs which facilitate the recognition of regularities in the diversity of some social phenomenon, which in practice cannot be 'imprisoned' in narrow definitions. Distinguishing among composite realities and classifying embedded phenomena are the essence of intellectual endeavours.

We will start with a clarification about the notions of "environmental" and "ecosystem" services. Both are often used interchangeably to refer to PES. According to the Millennium Ecosystem Assessment, "ecosystem services" can be defined as services that nature renders people ("Ecosystem services are the benefits people obtain from ecosystems" (MEA, 2005). Although, from an economic perspective, one can question the relevance of combining "the provisioning services" (which are about goods for which there are markets and, thus, market prices) and "regulating services" (which can be considered as positive externalities, that is without markets); it would be difficult to ignore this MEA framework that has gained so much importance in literature and policy debates.

If ecosystem services are benefits obtained from nature, we suggest that PES are related to "environmental services", which can be understood as remunerations for services rendered by

people to other people for the maintenance or the improvement of a given ecosystem service. Most of the analysts disregard this distinction or argue against it, considering PES as a joint production of amenities by the combined biophysical and socioeconomic processes (e.g. Wunder 2015: 6). This reluctance to separate ecological functioning and human actions affecting nature is probably associated to the proposed "new paradigm" (retrieving ancient cosmogonies) that sees the human being as part of the ecosystem (cf. Larrère&Larrère, 1997). However, following Teyssèdre et al. (2005)who urged scientists to distinguish between "ecological service" and "economic service" (specifying that "maintaining a scarce ecological service corresponds to an economic service"), we argue that a distinction should be made between, say, the pollination activity of insects (referred to as an ecological service by biologists) which can occur without any human action and the making of hives or the planting of flowers that will favour the activity of the pollinizing insects. The same can apply for water: on the one hand, sedimentation that occurs in ecosystems may filtrate and regulate water flows naturally, without human intervention while, on the other hand, land use activities may contribute to the maintenance or the enhancement of this natural ecological function. The frequent uncertainties concerning the outcome of a given land use in a specific site (i.e. keeping or planting trees for enhancing water quality, that can be the expected environmental service) and the result in terms of ecosystem services (i.e. the actual water quality) should ascertain the pertinence of distinguishing between the notions, despite the strong interaction between human actions and ecosystem functioning.

Distinguishing "services rendered by nature" and "services rendered by people", even if interactions are frequent between both, is critical in dealing with the issue of commodification. Ecosystem services are by nature collective goods (non-rivalry) or public goods (non-excludability and non-rivalry) since they are qualities associated with a certain state of the ecosystem (for instance the quality of the water from a watershed, or the quality of the natural habitat which favours biodiversity) and which cannot be exchanged.

3. PES and property rights

Characterising ecosystem services as a collective or public good by nature is not widely accepted. Wunder (2015), discussing the Muradian et al. (2010) tentative definition of PES referring to "the social interest" (see supra), argue that "not all environmental services are public" and specify: "some are club goods […], and yet others are fully private (e.g. when the only downstream user is a private brewery)". For reasons exposed above, Wunder does not distinguish between ecosystem and environmental services, but in the last example implicitly refers to the quality of water that is somehow 'appropriated' by the brewer. This quality is, for us, the ecosystem service that can be rendered without human intervention and that can be also maintained and enhanced through environmental services (adoption of a given land use). In this example, the quality of the water is not appropriated by the brewer but is likely to be a common pooled resource shared by the inhabitants of the watershed drawing from the same aquifer. The fact that the brewery is able to take advantage of this quality for its private production does not mean its owner is able to deprive its neighbours of the benefits they will get from access to high quality water[8].

[8]The same occurred in the well-known example of Vittel in France: the company paid the farmers to make major changes in farming practices e.g. avoid the use of pesticides, and diminish nitrate levels in the water

The argument is that some environmental services (generally referred to as 'ES') can be privately owned is also raised with regard to pollination and soil fertility. But, generally, these services are different from those associated with PES. Some beekeepers, for instance, move their hives by truck along the road and rent pollination services to famers (by parking the hives in the orchards for a few days). This clearly involves a market transaction; the farmer buys the pollination service since the bees are left on his land. But is this socio-economic practice the same as the one involved in PES? In this example (as for "fertilising contracts" practised in some rural areas between croppers and pastoralists), the service is rendered on the **land belong to someone else**, while in PES literature, the situations analysed refer to payments for actions to maintain or enhance ecosystem services on the lands owned (or controlled, in case of collective property) by the provider of the environmental service. A gardener planting trees on a municipal or private estate, that is not his own, is a salaried worker, not the recipient of a PES.

PES are proposed to those who have rights over lands and their resources. The payments are made for not using these property rights or using them in a different way. In sum, all the transactions involving ecosystems are not PES according to the framework for the ideal type of PES that has gradually emerged from the literature.

4. Environmental services and markets: on the issue of definitions

What about environmental services? Does paying for environmental servicesmake them synonymous with market-based relationships? Let us review some of the main tentative definitions of PES. PES are often described as MBIs in the literature. The definition of PES proposed by Wunder in 2005, and extensively quoted since then, has certainly contributed to this classification: "*a voluntary transaction in which a well-defined environmental service (ES) or a form of land use likely to secure that service is bought by at least one ES buyer from a minimum of one ES provider, if and only if the provider continues to supply that service (conditionality)*". This definition uses market terminology (buying and, implicitly, selling), which implies that the services have been appropriated prior to the transaction (one can only sell what one possesses). Alternative definitions,whichavoid linking PES to a market-oriented*view of the world,*have also been proposed. Karsenty (2011), suggested that "*a PES is a payment to an agent for services provided to other agents - wherever they may be in space and time - by means of a deliberate action aimed at preserving, restoring or increasing [an] environmental service agreed by the parties*". Wunder (2015:6) criticized this definition, pointing, rightly, to the issue deriving from the causal circularity associated with the reference to the sole notion of environmental service. Indeed, since making this first proposal, we have explored what could be identified as the distinction between environmental and ecosystem services. Replacing "environmental service agreed by the parties" by "ecosystem service" would avoid the imprecision caused by the circularity of the definition.

Tacconi (2012) underlined the importance of additionality in the PES definition he proposes ("*A PES scheme is a transparent system for the additional provision of environmental services through conditional payments to voluntary providers*", p. 35), as did Sommerville *et al.* (2009, p. 34). Both

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table. Today, Vittel, the farmers and the local inhabitants benefit from pure water, although the company benefits most financially.

definitions are influenced by the conviction that PES should be efficient, i.e. not pay for "business-as-usual". In practice, such criteria have not always been respected, in particular in government PES, like in Costa Rica, where the government paid landholders for business-as-usual (Pfaff et al., 2007; Pattanayak et al., 2010), simply because they were owners of forested land and they committed to keep it, without considering whether (or not) they inccured any opportunity costs. Another useful definition was proposed by Muradian et al., (2010, p. 1205) who considers "*PES as a transfer of resources between social actors, which aims to create incentives to align individual and/or collective land use decisions with the social interest in the management of natural resources*". As pointed out by Farley and Costanza (2010) "*most PES schemes actually pay for land uses associated with generating the service*" (p. 2062).

This emphasis on land use has major consequences for our conceptualization of PES, and leads to the frequent distinction between "landuse restricting" and "assetbuilding" PES (Wunder, 2005). Although the former can be categorised as negotiated easements for which compensation can be received (suspension of development rights), the latter are related to (remunerated) efforts invested in planting trees, fences or changing polluting agricultural practices. What qualifies them as PES is the fact that the efforts are focussed on the property (individual or collective) of the recipients (which distinguish the scheme from the case of a municipal gardener)[9]. We argue that the term market-based relationships isnot appropriate to describe PES, while there are some cases where PES can be organized throughcompetition to select service providers, such as inverted auctions. And the fact that there are markets for carbon credits generated by certain types of forestry projects (CDM or REDD+) does not mean the landusers, whose practices are directlyresponsible for carbon emissions, are selling environmental services.

5. PES and the markets of "carbon credits"

Let us consider the case of payments for maintaining endemic biodiversity through habitat conservation or species monitoring (Wunder and Alban, 2008; Clements et al., 2010; Sommerville et al., 2010). By definition, endemic species are not substitutable and looking for equivalence (a metric) would not make sense. Nevertheless, some PES aremore amenable to metrics. The maintenance or enhancement of the quality and amount of water – the most frequent PES scheme – can be assessed using different metrics (microbiological composition, turbidity, concentration of inorganic compounds, litres of water per second).But, unlike CO_2, which has a global impact regardless of where it is emitted, in this case, there are no polluting rights to beexchanged. The physical nature of the environmental service of water regulation and the specific links its creates between the provider and the user do not allow for a transfer in its canonical sense, nor for competition between several possible users and providers. As Wunder and Vargas (2005) put it, a payer who "*thinks the price for watershed protection charged by upstream farmers is too high, ususally cannot just go for the next three watersheds for better offers*". In these circumstances, commodification is simply not possible, and any attempt to create *ecosystem marketplaces* is prevented by the very nature of the services and the impossibility of allocating property rights on them.

[9]Here, we do not consider "transferable development rights "(Chomitz, 2004) as PES, inasmuch they are based on prior capping of property rights by law, and are not directed towards the provision of more ecosystem services but rather a reduction in the social cost of a given environmental target. Neither do we consider certification as a PES, since the price premium (when there is one) for the products is largely disconnected from the service (indirect inventive).

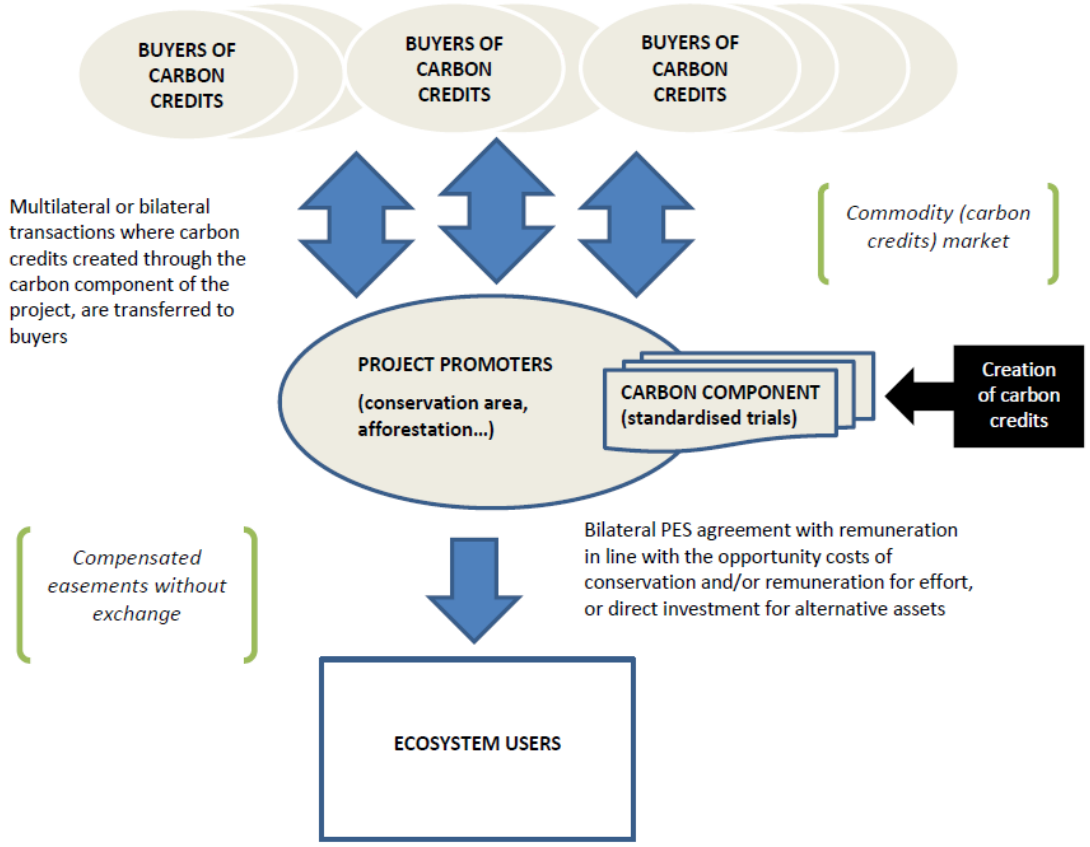
If an environmental service can be expressed as a relatively homogenous unit, like the CO_2 equivalent which can be used as a metric for a reduction in greenhouse gas emissions, then a tradable asset can be *created* (the "carbon credit"), and this credit (and only this credit) can be echanged on a market for emission permits. *But such a good is no longer an environmental service*: the service which is provided is the reduction in carbon emissions; and it is contingent, i.e. it can be rendered without the issuance of "carbon credits". A carbon credit is produced bya standardized and quite costly procedure (set by voluntary standards) and separated from the underlying contract (if there is a contract) in which a land holder agrees to perform a negotiated land management activity. And, unlike environmental services which are "externalities", carbon credits are, indeed, subject to appropriation.

The fact that the promoters of REDD+ projects can sell "carbon credits" (offsets) derived from the estimated avoided or captured emissions entailed by the prevention of an alternative land use option does not alter the nature of - or support for - the transaction (the land-use agreement) concluded between the land users and the project/promoter. Furthemore, through carbon measurements, setting, certification, and marketing reference emission levels and MRV (Monitoring, Reporting and Verification) operations, there is a specific prodution process of the tradable assets (the carbon credits) which, although these depend on the field context, makes them a genuine *creation* by the project promoter (Karsenty *et al*., 2014) which is *contingent* to the PES itself, i.e. payment for the land-use agreement[10]. And the carbon credit is *not* the environmental service: it is, in the best case, a quasi-monetary sign acknowledging a certain amount of emission reduction deriving from a bilateral land use agreement between the project promoter and the direct land users – those who provide the service of reducing emissions (see figure 1). In sum, it is difficult to see any tangible *commodification of nature* in such transactions which do not entail the transfer of property rights, even though one might consider such PES are "backedagainst"[11] the carbon markets without being market-based.

[10]A parallel can be drawn with the principle of patents: as recalled by a 2013 decision of the US Supreme Court (n° 12-398, Myriad Genetics), natural phenomena cannot be patented (and are consequently not marketable), neither is a process reciting a law of nature patentable, unless that process has additional features (genetic modification of a living organism, for instance) . The additional feature, in the case of a PES, is the creation of "certificates of emission reductions" commonly referred to as carbon credits.

[11] This term is suggested by an expression used by R. Pirard (2013) in French ("adossés aux marchés") about PES

Figure 1: *Schematic diagram of the articulation of a PES component and the carbon credit transactions compartment (REDD+ project type)*



In PES (i.e. voluntary) schemes, land use rights are frozen by the PES recipient as long as payments continue, and not transferred. A transfer of property rights would require other institutional arrangements, such as a lease, concession or purchase. But, in such cases, this would imply a shift from PES to a very different situation, which has been referred to as "*green grabbing*" by some authors includingFairhead et al. (2012). Like some PES, such operations can be driven by the opportunities for profit offered by the development of the carbon market, or the desire to compensate for environmental damage through land acquisition (or long-term renting) for conservation (e.g. "conservation concessions"). But these operations are fundamentally different from PES in the sense they are based on a permanent or temporary (lease) transfer of property rights[12]. In addition, renting the land, even for a short period, often implies physical intrusion by the taker and displacement of former land users, which is not the case with PES.

6. The case for hybrids: selection through auctioning

In "asset-building" PES schemes, when the time invested by land users in ecosystem restoration and planting the land they control is to be paid for, the basis of the payment is the working time invested, possibly bonified by the species planted (or their location). Introducing competition in the supply of labour is limited by the number of land users/owners who are called to work on their own estates.

[12]On this point, we agree with Sommerville et al's (2009) analysis that "*any intervention where one-time property rights are transferred to another group, would not likely be considered as PES approaches*" (p. 34).

But if a service payer is looking for an environmental service which consists in planting 10,000 trees of a given species in a given area (to enhance the ecosystem service of pollination, for instance), he/she can launch a call for tendersto select farmers who will commit themselves to planting the trees on their property at the least cost. Similar competitive procedures can be envisaged for PES which restrict landuse, and some current payment schemes use inverse auctioning to select the service providers in some countries, notably in the USA and Australia (Latacz-Lohmann and Schilizzi, 2005): if the payer believes the ecosystem service (a quality threshold) can be renderered with a minimum number of landusers conserving wetlandson their property or conserving the plant cover on the uplands they control, the payer can select them using a reverse auction procedure.

In such a case, a market-based *procedure* for selecting the environmental service providerstakes place, but this fact does not end the debate on whether the instrument is marketbased or not. Lapeyre and Pirard (2013) ask, "*what should be considered as an instrument: the entire agro-environmental scheme or just the reverse auction?*". In this case, the PES could be analyzed as "hybrid" arrangements (Ménard, 2004), similar to what Vaissière and Levrel (2015) proposed for biodiversity mitigation banking. For Ménard (2004:351), hybrids "*rely on partners who maintain distinct property rights and remain independent residual claimants*". The composite nature of this scheme, that uses market-based procedures but does not entail the transfer of property rights, set the stage for hybrid arrangements in which some PES are much closer to the market than others.

Will most PES in the future be managed through such hybrid arrangements? It is interesting that auctioning is favoured by economists for reason of efficiency (see Munoz Pina *et al*.), but that selecting the providers through auctioning could lead to the opposite result. Selecting the lowest bidder tends to mean selecting landowners with zero or very low opportunity costsfor conserving portions of their estates. As Blackmore *et al.* (2013:12) stated in the context of Australia, "*Additionality of outcomes may be of concern in Australian [conservation tender] programs [that] may be failing to achieve biodiversity benefits greatly in excess of those that would have been achieved in any case. Moreover, this finding is in line with the limited additionality observed in environmental stewardship programs in the United Kingdom* (Jones *et al.,* 2010)".

In most cases,*selecting*a small number ofproviders of environmental services is not the best way to achieve the objective of preserving or enhancing a threatened ecosystem service: the conservation of endangered species, for instance, needs the broad*cooperation* of farmers and other land users, not the *selection*of some of them. Climate change mitigation requires huge efforts in all sectors all over the world, which is the exact opposite of selecting only those with the lowest abatement costs.

Conclusion

It is striking how both unconditional advocates of market solutions, on one hand, and authors who are more attached to public regulations on the other, classify instruments as different as transferable permits, taxes and PES in the very same category of *market-based instruments*. Such a classification is used either to praise the instrument in the name of its alleged efficiency, or the contrary, to refuse it as a neoliberal solution for commodifying nature. Both arguments can be contested.Here our aim wasto exemplify the use and misuse of the "market-based" concept through a review of institutional economists'definitions of what a market actually is, and what is exchanged on them. Goods or services to be exchanged should be appropriated in advance. By their very nature,ecosystem

services, i.e. the services rendered by nature, are collective or public goods, the properties of ecosystems, and as such cannot be appropriated or exchanged; only modified. What could be the subject of market-based relationships are environmental services, i.e. how the services people render to other people in return for enhancing ecosystem services through their land-use practices,are framed.

Distinguishing "asset-building" and "land-use restriction" PES can helpgrasp the different relationships such schemes have with markets. In both types, providers can sometimes be selected through a competitive procedure (auction) which still might not justify referring to the entire scheme as market-based, but may be analysed as a hybrid form between market-based instruments and bilateral agreements often related to the setting of environmental easements. When payments reward the work time invested by a farmer in planting trees or building fences *on his/her own land*, there is a monetary relationship for what remains a bilateral agreement with no transfer of property rights. This would be very different for out-growing plantation schemes, where the investor *acquires,* by contract, *the exclusive right*topurchase the future production. On the other hand, *at landscape level*, it is still possible to select environmental service providers through competitive bidding (reverse auctioning), even though, in practice, enhancing threatened ecosystem services often requires the broadest possible collaboration rather than selection. Like most "land-use restriction" PES, asset-building PES do not entail transferring property rights from landholders to environmental service users –land-use rights are voluntarily suspended but not transferred, even temporarily. This is a good reason for not confusing this subset of PES (the one most people usually have in mind) with genuine MBIs.

It is also surprising to see such wide acceptance of markets equated with incentives –even though both change relative prices, especially by authors who describe themselves as critical vis-à-vis "mainstream" economic theory, which generally refers to the neoclassical economy and its variants. We argue that this interpretation masks an ideological attempt to introduce a hierarchy – and not simply a distinction – between (allegedly) *smart and efficient* (market) instruments and (still allegedly) *burdensome and inefficient* (administrative) regulations.

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